

Teachers Want to Know

September 2010

A tip sheet for teachers to support instruction and assessment practices that improve mathematics achievement.

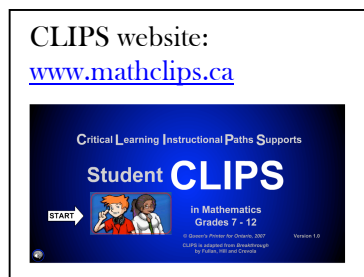
Math CLIPS

The question:

How can use of CLIPS increase student achievement in mathematics?

The answer:

CLIPS (Critical Learning Instructional Paths Supports) are multi-media learning objects focused on key topics identified through research as needed by a significant percentage of students. CLIPS are available to students, teachers, faculties of education, parents 24/7.



Make gains with CLIPS by:

1. Planning Lesson Sequences
2. Teaching in the Digital World
3. Engaging Learners
4. Reaching All Students
5. Building Professional Knowledge

1. PLANNING LESSON SEQUENCES

CLIPS tasks and instructions are sequenced to build from one key idea to the next, so that they make cumulative sense to students. Focused interactions allow students to engage in learning targeted concepts and skills, and use self-checking practice and immediate feedback to gain confidence that learning has happened.

CLIPS are continually updated.

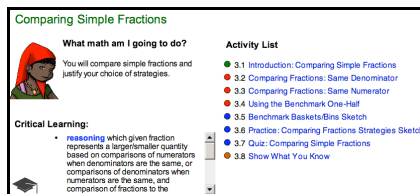
Sample collections/clusters:

- Fractions Representing Part/Whole Relationships
- Integers – Representing, Comparing & Ordering
- Periodic and Sine Functions & Their Transformations
- Representations of Linear Growing Patterns

“CLIP List” screens identify targeted mathematics for each CLIP and include a video which could be used to activate a whole group.



“Activity List” screens have learning goals to share with students, based on the Critical Learning which connects targeted skills and concepts to mathematical processes. (View by clicking on hat icon.)



The colour-coded Activity List includes introductory activities (green), interactive action tasks (red), consolidation activities (blue), and a Show What You Know list of low-prep ways for students or a group of students to show what they learned in a variety of ways (brown).

In order to maximize the use of CLIPS with students (for the greatest achievement gains), teachers should strongly consider using the CLIPS in conjunction with (and integrated with) classroom instruction focused on the same concepts. Teachers can use the CLIPS tasks or demonstrations as springboards to engage students in mathematics discourse during activation and consolidation phases of the three-part lesson. (Research Report)

The purposeful selection of CLIPS activities integrated with regular classroom teaching involves using a variety of student groupings including whole group activation or consolidation on an interactive whiteboard (IWB), pairs collaborating on an activity, and individuals self-assessing with a game, quiz, or activity.

While students work on CLIPS teachers observe, have focused conversations, and diagnose areas that need further work.

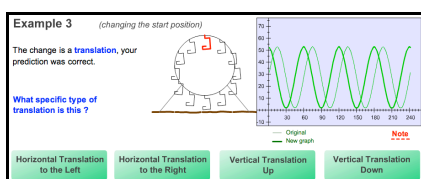
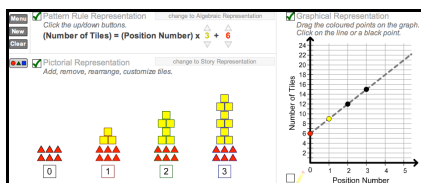
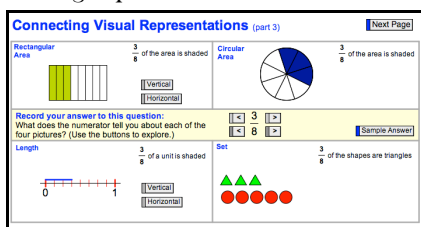
Additional planning supports for teachers can be found under a tab in the Teacher Notes area (apple icon in the wrapper). A wiki links to Content at a Glance (overview of activities and their math content), websites for students and teachers, Gizmos® (online simulations), and Research.

2. TEACHING IN THE DIGITAL WORLD

CLIPS allow opportunities for students that do not exist without the use of technology.

CLIPS quizzes emerged as a favourite feature of the program. Students were seen repeating quizzes over and over until they got all the answers right. (Research Report)

Advantages of learning in a digital world through CLIPS include: audio controls and navigation buttons giving students control over the environment and their pace; immediate and descriptive feedback addressing misconceptions and misunderstandings quickly and clearly; dynamic visuals helping students understand key concepts and make connections among representations.



When using technology as a learning strategy cooperative norms need to be established for collaborative work. Many students benefit the most by working with a learning partner to discuss what they are doing on the computer. Researchers observed an increased precision in the use of math language when students used CLIPS.

Those teachers who had SMARTboards and easy access to multiple computers or laptops in their own classrooms certainly found the implementation of CLIPS ideal. (Research Report)

Activities as swf files can be imported for use in a lesson that uses an IWB.

CLIPS Technical Requirements:

- browser (like Internet Explorer, Safari, Firefox, or Chrome)
- internet connection (or use zipped files for local installation)
- Adobe Flash Player v8 or newer
- The Geometer's Sketchpad® v4 or newer (for some activities)
- headphones recommended

Teachers could consider flip sequencing, assigning CLIPS activities for homework then using class time for consolidation, extensions and practice.

3. ENGAGING LEARNERS

Teachers reported that students found working with CLIPS engaging. The animation created opportunities for students to interact with the material, from filling in numeric values, dragging words to complete sentences, to more sophisticated and rich interactions such as constructing patterns using virtual tiles or graphs using the graphing tool. (Research Report)

4. REACHING ALL STUDENTS

CLIPS facilitates differentiating with respect to readiness, interests and learning preferences.

I liked how it was talking at you at the same time, but it had everything down to the side, so if you didn't quite understand it, you could re-read it yourself and understand it from that. (Grade 7/8 student)

The audio narrations and dynamic animations appeal to multiple learning styles and help students focus their attention. Students work at their own pace, with the immediacy of being able to review any part of an activity at the time it is not understood.

All my students with learning disabilities were doing what everyone else was doing - all the same lessons. And they're doing fine. That's huge - that these kids can engage in the same activities and communicate their thinking to the class. There was no IEP in place for this. They all did the exact same thing and I did not accommodate any student at any time for this. And everyone did well. (Grade 8 teacher)

Enriching and extending activities to differentiate instruction for disengaged and bored students are available through Resource and Teacher Notes areas.

5. BUILDING PROFESSIONAL KNOWLEDGE

Teachers report that their own content knowledge and assessment practices improved while using CLIPS.

Teachers within a school or board can collaboratively build professional knowledge using CLIPS through

- lesson studies
- action research projects
- coaching
- mentoring
- co-teaching

CLIPS facilitates learning for all.

RESOURCES

12-min virtual tour of clips:
<http://edugains.ca/resources/LearningMaterials/CLIPS/index.htm>

Research reports and articles:
www.tmerc.ca
<http://legacy.oise.utoronto.ca/research/field-centres/ross/vita.htm>

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